

REMARKS

In the November 4, 2003 Notice of Allowance, all of the previously pending claims were allowed over the prior art of record.

Status of Claims and Amendments

In response to the November 4, 2003 Notice of Allowance, Applicants have added new claims 25-32. Thus, upon entry of this Amendment, claims 2-4, 6-14, 16-17, 19 and 21-32 will be pending, with claims 4, 6, 8-9, 11, 21-24, 27 and 30 being the only independent claims. Entrance and consideration of this Amendment are respectfully requested. Also, reexamination and reconsideration of the pending claims are respectfully requested in view of the above amendments and the following comments.

New Claims 24-32

Applicants have added new claims 24-32 with claims 24, 27 and 30 being independent claims. Specifically, claims 24-29 are directed to an axial metallic face seal as shown in Figures 1-5, while claims 30-32 are directed to a radial axial metallic seal as shown in Figures 6 and 7.

Basically, independent claim 24 recites an **axial** metallic face seal that has

- (1) first and second annular end sections and an annular center section being arranged to form an **S-shaped cross sectional profile** that primarily deform due to torsional stress of the metallic seal, and
- (2) the **annular center section having a slope that is not greater than 45°** with respect to said center longitudinal axis.

Basically, independent claim 27 recites an **axial** metallic face seal that has

- (1) first and second annular end sections and an annular center section being arranged to form an **S-shaped cross sectional profile** that primarily deform due to torsional stress of the metallic seal, and
- (2) the first and second sealing surfaces being spaced apart by a **first axial distance** measured parallel to the center longitudinal axis **that is smaller** than a **second radial distance** measured perpendicular to the center longitudinal axis between the first and second sealing surfaces.

Basically, independent claim 30 recites a **radial** metallic seal that has

- (1) first and second annular end sections and an annular center section being arranged to form an **S-shaped cross sectional profile** that primarily deform due to torsional stress of the metallic seal, and
- (2) the first and second sealing surfaces being spaced apart by a **first axial distance** measured perpendicular to the center longitudinal axis **that is greater** than one-half of a second axial distance measured parallel to the center longitudinal axis between the first and second sealing surfaces.

In contrast, the Sumida et al. patent appears to show an **axial** seal with an annular center section 53 having a **slope greater than 45 degrees** (i.e., approx. 65 degrees) and sealing surfaces 54 and 55 spaced apart axially and radially, such that the axial spacing (i.e., first axial distance) is **greater** than the radial spacing (i.e., second radial distance). See Fig. 2 of the Sumida et al. patent. Thus, the slope of the annular center section 53 of the Sumida et al. patent is **not** smaller than 45 degrees, as recited in claim 24, and the first distance of the Sumida et al. patent is **not** smaller than the second radial distance, as recited in claim 27. Regarding claim 30, the Sumida et al. patent is directed to an axial face seal, while claim 30 orients the sealing surfaces parallel to the center axis to clearly recite a radial seal. Thus, the Sumida et al. patent is not a radial seal as set forth in claim 30.

Clearly, the structures of these claims are **not** anticipated by or render obvious by the Sumida et al. patent or any other prior art of record. It is well settled under U.S. patent law that for a reference to anticipate a claim, the reference must disclose each and every element of the claim within the reference. Moreover, it is well settled in U.S. patent law that the mere fact that the prior art can be modified does **not** make the modification obvious, unless the prior art **suggests** the desirability of the modification. Accordingly, the prior art of record lacks any suggestion or expectation of success for modifying the Sumida et al. patent to create the Applicants' unique arrangement of the first and second distances as set forth in claims 24-32.

These claims provide a *unique dimensional relationship* which results in the metallic seal being deformed in a particular way. For example, lines 6-11 on page 7 of the present application state that

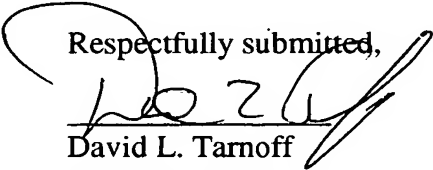
By designing the seal's *cross-sectional profile* as shown in Figure 4, the *deflection of the section is controlled*. By varying the cross section (thickness, *radius of curvature* at the seal interface, *angle*, *height and radial width*) the *load can be designed* such that the seal will function in a variety of seal gland depths, and with different coatings, each with their own specific yield strengths, i.e. requiring more or less load to create a condition whereby the coating plastically deforms over a given width.

In other words, the present invention has a unique cross-sectional profile with specific radii of curvature, angles and dimensional relationships that provide the unique sealing characteristics of the present invention. In contrast, the Sumida et al. patent has a different cross-sectional profile which makes the Sumida et al. seal deform in a different manner. Applicants respectfully assert that there is no motivation or suggestion to modify the unique arrangement of the Sumida et al. seal structure to meet the limitations of the claims of the present invention.

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In view of the foregoing amendment and comments, Applicants respectfully assert that claims 2-4, 6-14, 16-17, 19 and 21-32 are now in condition for allowance. Reexamination and reconsideration of the pending claims are respectfully requested.

Respectfully submitted,


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